This presentation is a brief summary of an 8-hr workshop for southeast regional NMFS Marine Mammal Stranding Network staff given by veterinarians Mike Ziccardi and Shawn Johnson in Charleston, SC, May 1, 2007.

Jim J.

OVERVIEW OF OILED WILDLIFE RESPONSE

Michael Ziccardi & Shawn Johnson
Oiled Wildlife Care Network
Wildlife Health Center; UC Davis

Oiled Wildlife Response

Recovery & Transport

Processing & Intake

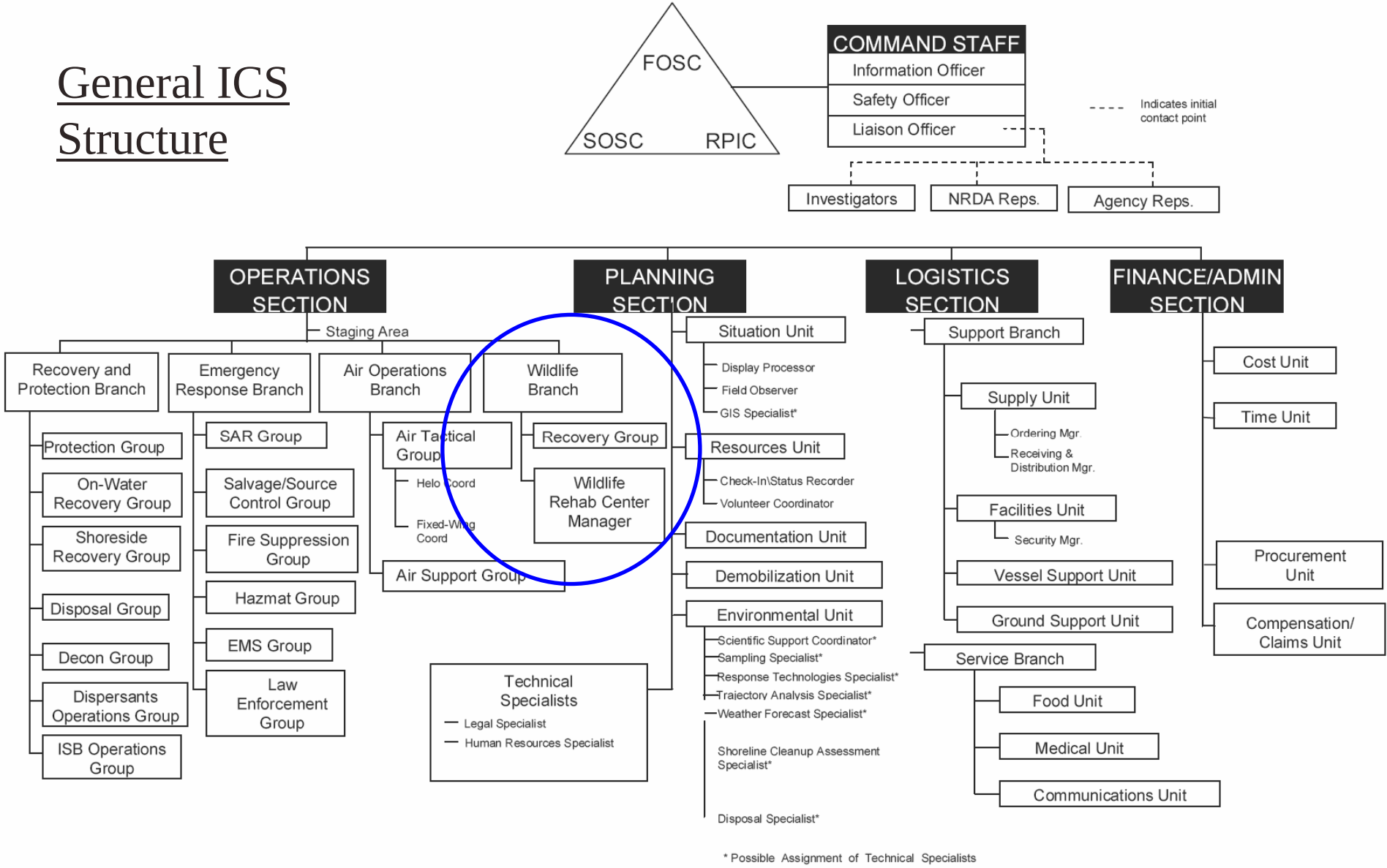
Stabilization

Cleaning

Conditioning

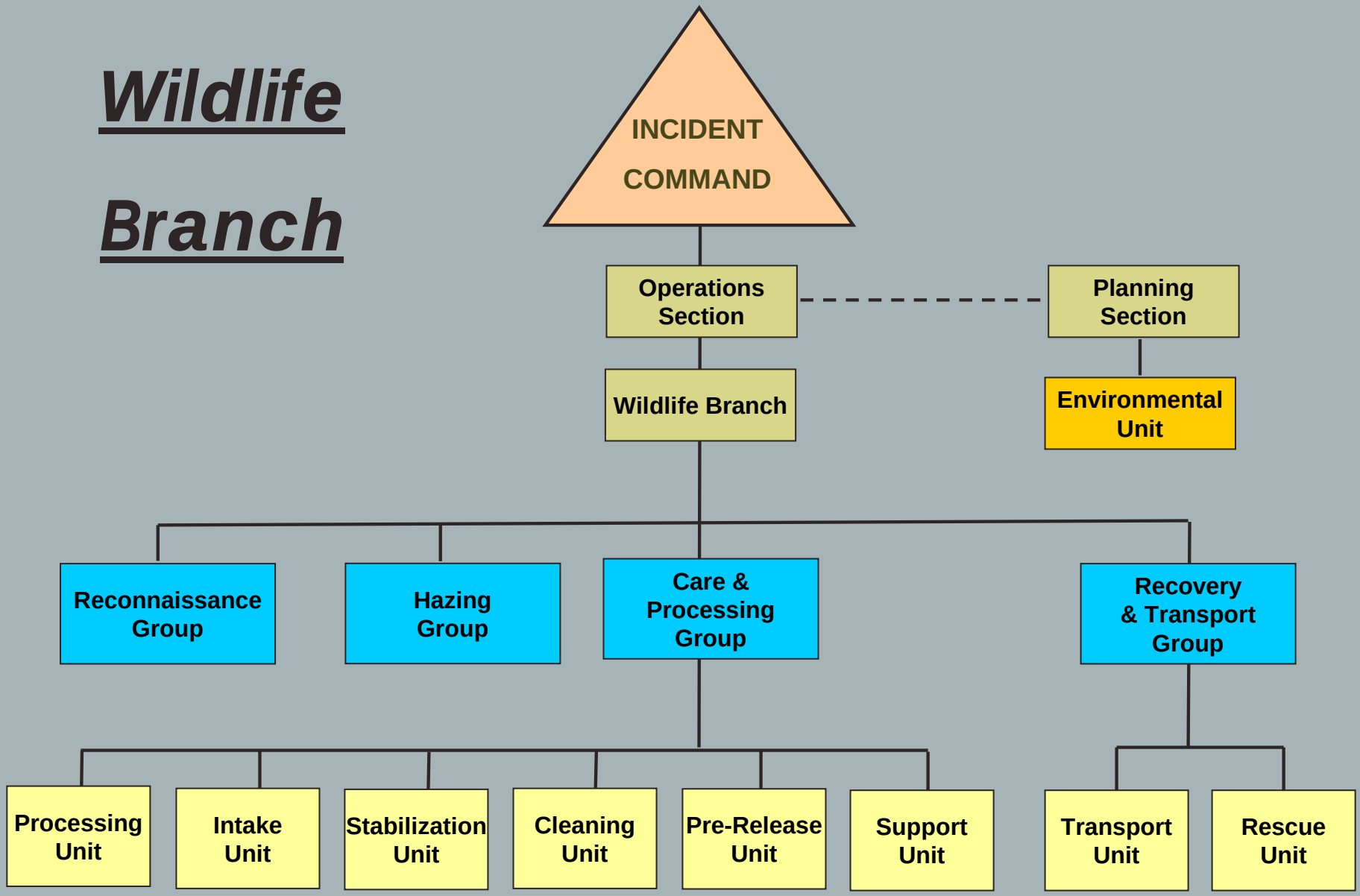
Release & Monitoring

General ICS Structure



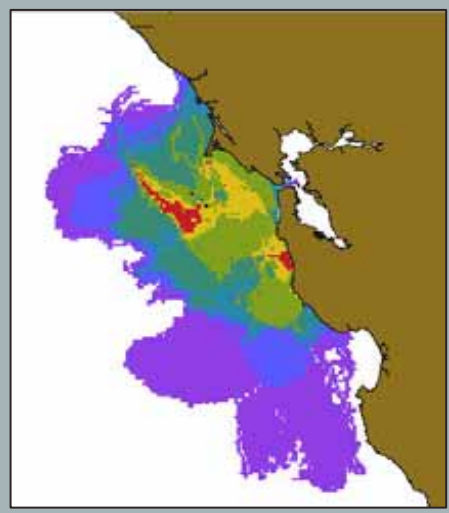
Source: USCG FOG

Wildlife Branch



Importance of Organized Oiled Wildlife Response

- Can be important for individual and population health
- Detailed data can assist non-animal-related response
- Animal impacts can prompt large-scale projects
- Proactive planning and actions can reduce future wildlife impacts
- Local animal care involvement crucial at all stages



Wildlife Field Operations

- Components
  - Assessment & monitoring
  - Pre-emptive Management
  - Capture of live oiled animals
  - Collection of dead oiled wildlife
  - Field stabilization and transportation
- Most successful when:
  - Pre-planned
  - Well organized
  - Initiated immediately after notification of a spill
  - Work effectively within the entire response

Assessment

- Identify environmentally sensitive areas
- Identify culturally sensitive areas
- Identify species at risk
- Evaluate potential for hazing or pre-emptive capture opportunities
- Report to EU within Planning

Pre-emptive Management

"An ounce of prevention is worth a pound of cure"

- Types:
  - Deterrence and Displacement
- Use when oil containment fails:
  - Prevent oil exposure
  - Allow time for environmental clean-up
- Planned & implemented by NOAA Fisheries, in consultation with Wildlife Branch Director
  - Performed by trained personnel with appropriate federal permits

Deterrence “Hazing”

A Review of Marine Mammal Deterrents

NMFS Report, E. Petras, 2003

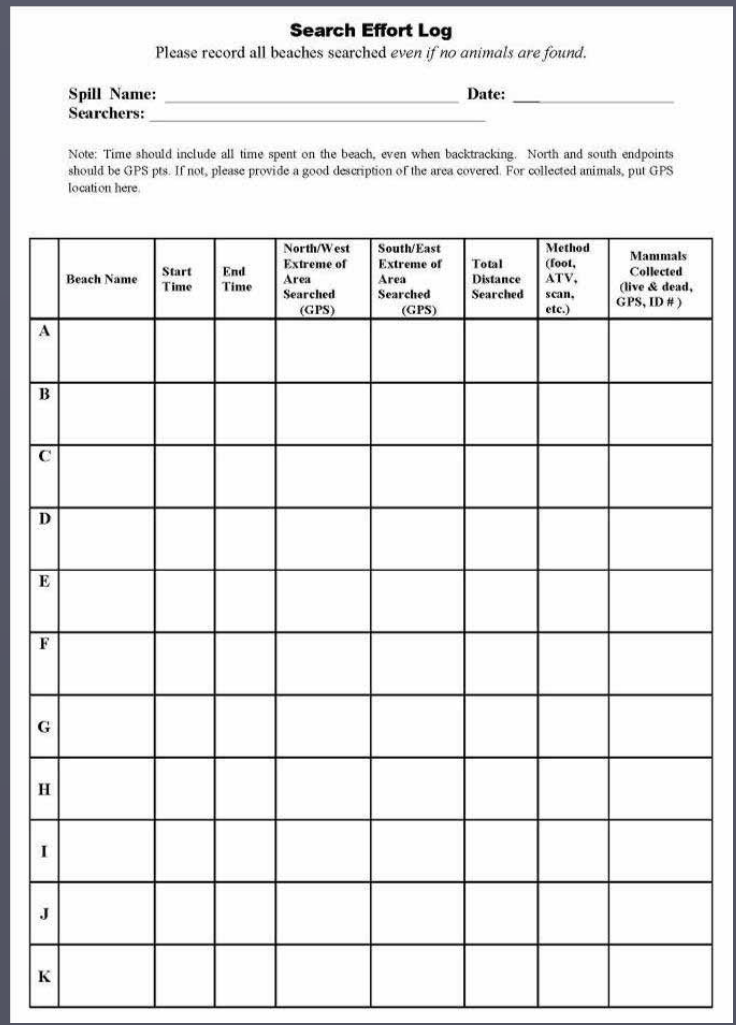
- Firecrackers
- Cracker Shells
- Acoustic Deterrent Devices (ADDs)
- Acoustic Harassment Devices (AHDs)
- Vessel Chase/Harassment
- Physical Barriers
- Predator Sounds

Displacement

- Capture and Relocation
  - Remove animal from oiled or at risk areas
  - Transport and release at alternate location
    - Prevent further animal disturbance
    - Provide time for environment clean up

Documenting Live and Dead Wildlife in the Field

- Search Effort Log
- Minimum information
  - Incident Name
  - Date - Time
  - Beach location
  - GPS Location
  - Name of Collector



Search Effort Log

Please record all beaches searched *even if no animals are found.*

Spill Name: _____ **Date:** _____
Searchers: _____

Note: Time should include all time spent on the beach, even when backtracking. North and south endpoints should be GPS pts. If not, please provide a good description of the area covered. For collected animals, put GPS location here.

	Beach Name	Start Time	End Time	North/West Extreme of Area Searched (GPS)	South/East Extreme of Area Searched (GPS)	Total Distance Searched	Method (foot, ATV, scan, etc.)	Mammals Collected (live & dead, GPS, ID #)
A								
B								
C								
D								
E								
F								
G								
H								
I								
J								
K								

Dead Wildlife

- Dead animals must be removed from the environment
  - Prevents secondary poisoning of scavengers
  - Reduces repeated field evaluation
  - Evidence
  - Important to ongoing planning
  - Part of clean-up operation
- Prevent Carcass Contamination
  - Wrap in foil or paper for transport, storage

Oiling Assessment

Difficult to detect oil on marine mammals

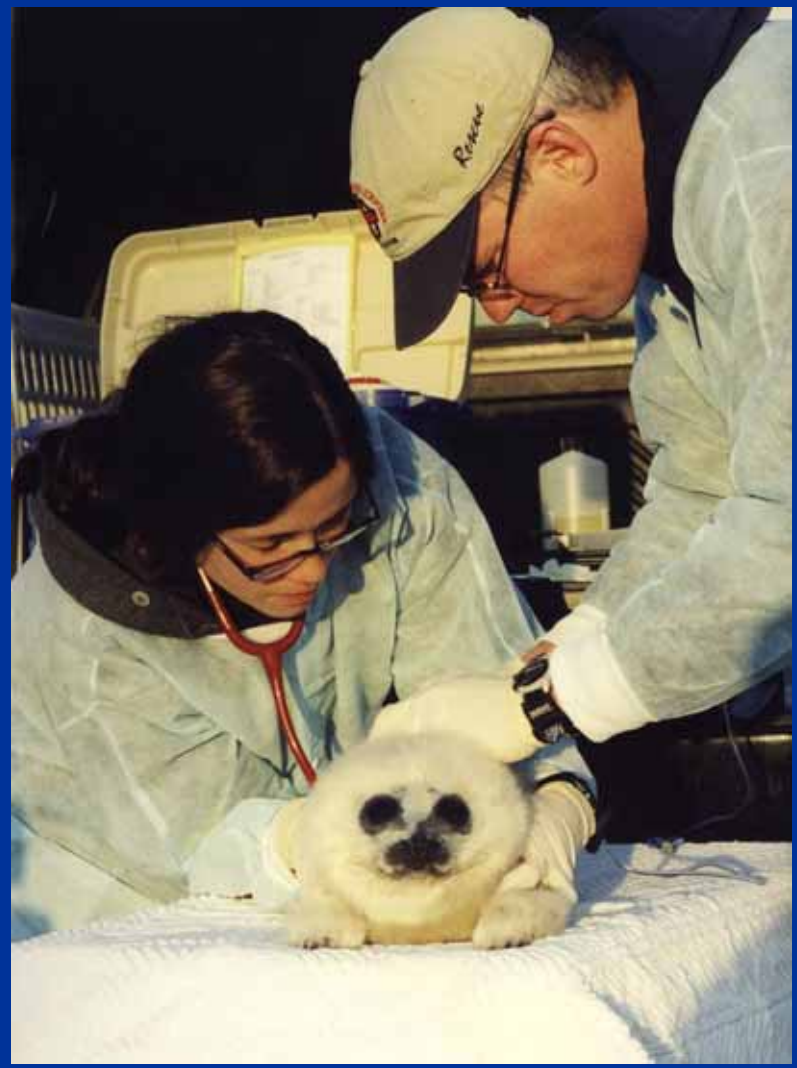
- Dark pelts w/natural sheen
- Low-level exposure
- Long period since oiling


Oiled?

Processing and Intake

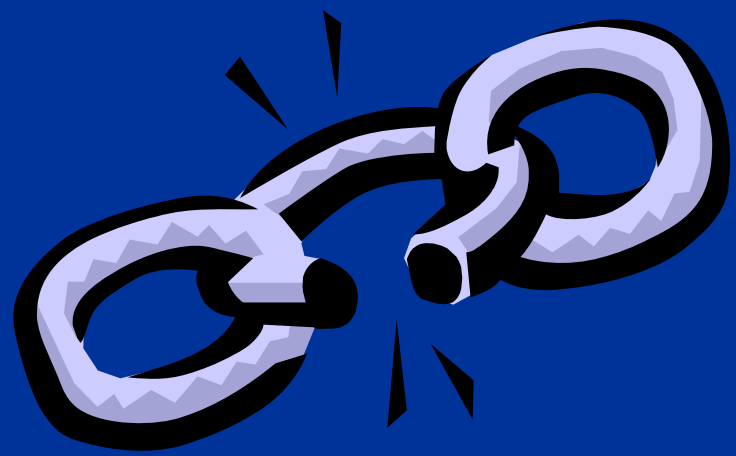
Processing vs. Intake

- Processing: Legal
  - Information - Field, animal
  - “Samples” - Photo, oil
  - Chain of Custody
- Intake: Health
  - Medical exam
  - Biomedical sampling
  - Initial treatment plan



Evidence Control
Chain of Custody

- "Proof that physical evidence was taken from a particular person or place which makes the item relevant as evidence in the trial"
  - Testimony
  - Physical evidence
- Maintained through use of:
  - Standardized protocols
  - Pre-approved forms
  - Pre-trained personnel



Standard Processing Procedures

- Collation of field data
- Identification of animal
  - Species, flipper tag, log #
- Collection of oil sample
- Taking of photograph
- Completion of logs
  - live & dead animal

Intake Logs

Oiled Marine Mammal Data Log: LIVE Animals

Oil Spill Name:				Facility:					
Intake Log Number (L-xxxx)	Date Collected (m/d/y)	Time Collected (24 hr)	First Initial & Last Name of Collector	Beach Search Number	Collection Location (Beach Name)	GPS Coordinates (N) GPS Coordinates (W)	Field Tag #	Date Arrived (m/d/y)	Time Arrived (24 hr)

Front Side of Page _____

Oiled Marine Mammal Data Log: LIVE Animals (continued from front side)

Oil Spill Name:				Facility:								
Intake Log Number (L-xxxx)	Date Processed (m/d/y)	Time Processed (24 hr)	First Initial & Last Name of Examiner	Species	Tag Color/ Number	% Oiled	Sample/ Photo Taken? (Y/N)	Disposition Date (m/d/y)	Disposition Status (R,D,E,T)	Release Tag	Morgue ID	Notes

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External Oil Sample Collection

* Supplies *

- Wooden applicator
- Fiberglass/Cotton cloth
- Glass jar – solvent cleaned with Teflon-lined lid
- Label, Custody Seal

External Oil Sample Collection

Procedure

- Collect sample
  - Scrape oil off hair with wooden applicator
  - If oil not visible, rub hair with cloth in circular motion
  - Tar Patches: Clipping hair ok if not fur seal/sea otter
- Place sample in glass jar
  - Do not allow the nitrile gloves to touch the oil sample
- Label jar
- Apply Custody/Evidence Tape
- Store sample in -20°F or colder locked freezer

Photograph

- Show oiled area and tag
- Include animal/spill info
  - Info: Spill name, date/time, log/tag #, species
  - Method: Dry erase board or Sharpie
- Polaroid or Digital
- Secure Photo or Digital Media

Dead Animal Processing

- Identify carcass
  - Species, date of stranding, date of death, tag and/or other I.D.
- External Exam
- Photographs
- Sample External Oil
- Collect Carcass
  - Do not contaminate
- DEAD Animal Intake Log

Dead Animal Log

Oiled Marine Mammal Data Log: DEAD Animals

Oil Spill Name:					Facility:								
Intake Log Number (D-xxxx)	Date Collected (m/d/y)	Time Coll'ted (24 hr)	First Initial & Last Name of Collector	Beach Search #	Collection Location (Beach Name)	GPS Coordinates (N) / (W)	Tag # (Field or Temp w/ Color)	Date Arrived (m/d/y)	Time Arrived (24 hr)	Date Proc'ed (m/d/y)	Time Proc'ed (24 hr)	Name of Processor	Species

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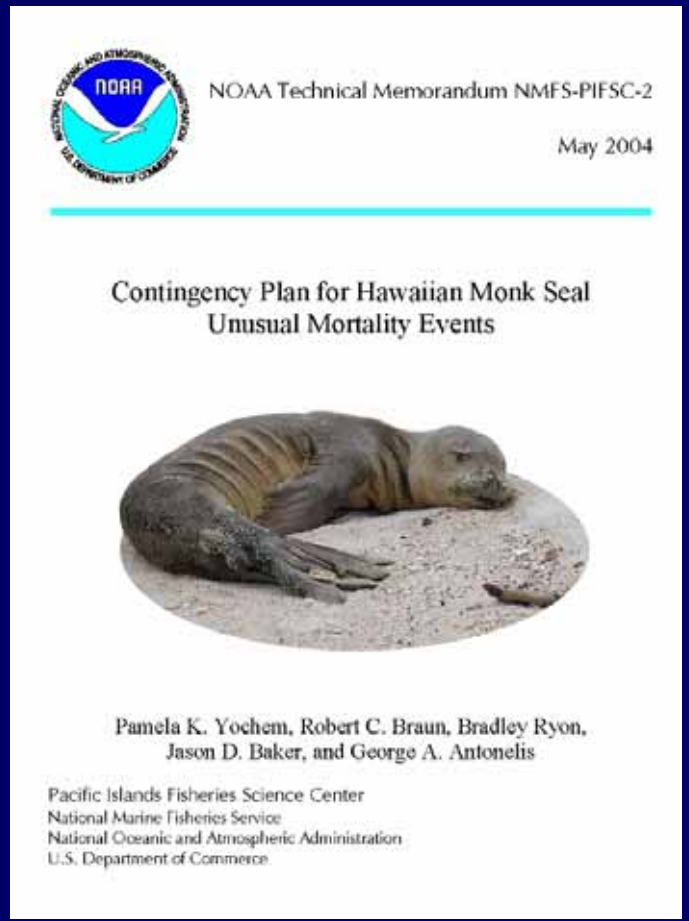
Appendix 3. Dead Marine Mammal Data Log

Dead Animal Processing

- Chill/Refrigerate carcass
  - freeze if timely (<24 hrs) necropsy not possible/desired
- Necropsy
  - Request authorization from trustee agency!

Necropsy

- Request authorization
- Perform Fresh (< 24 hrs) or Freeze
- Qualified Veterinarian/Pathologist
  - Marine mammal experience
- Follow Necropsy Protocols
  - Follow species specific protocols
    - *Contingency Plan for Hawaiian Monk Seal Unusual Mortality Events* (Yochem, et al. 2004)
    - *Right Whale Necropsy Protocol* (McLellan, et al. 2004)
    - *Orca Necropsy Protocol* (Raverty and Gaydos, 2004)



NOAA Technical Memorandum NMFS-PIFSC-2

May 2004

Contingency Plan for Hawaiian Monk Seal Unusual Mortality Events

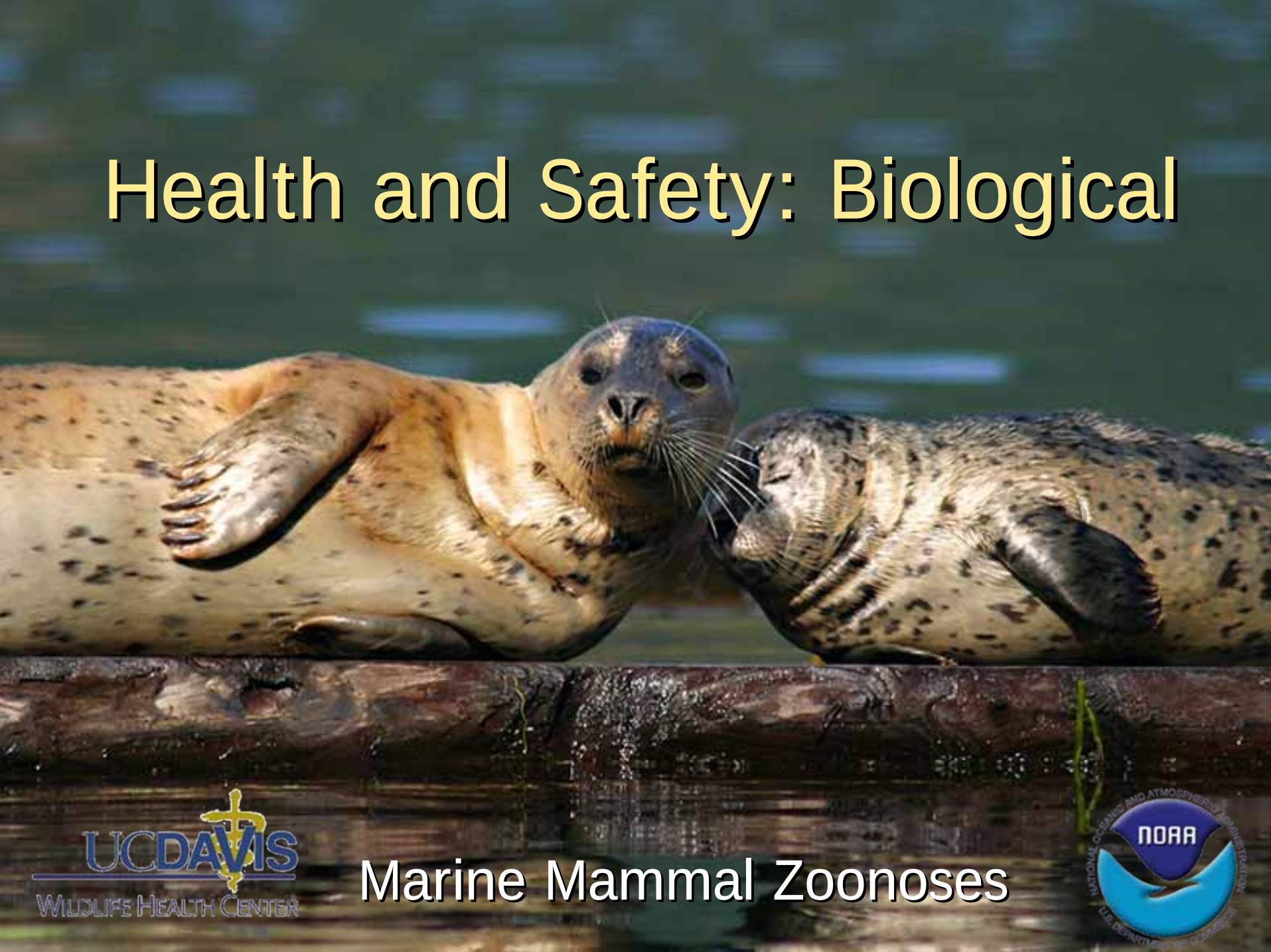
Pamela K. Yochem, Robert C. Braun, Bradley Ryon, Jason D. Baker, and George A. Antonelis

Pacific Islands Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

General Necropsy Protocols

- *CRC Handbook of Marine Mammal Medicine*
- *Pinneped forensic, necropsy and tissue collection guide* (NOAA Tech Memo NMFS-OPR-94-3), Dierauf, 1994
- *Field Manual for Phocid Necropsies (specifically Monachus schauinslandi)* Winchell, 1990

Health and Safety: Biological



UCDAVIS
WILDLIFE HEALTH CENTER

Marine Mammal Zoonoses

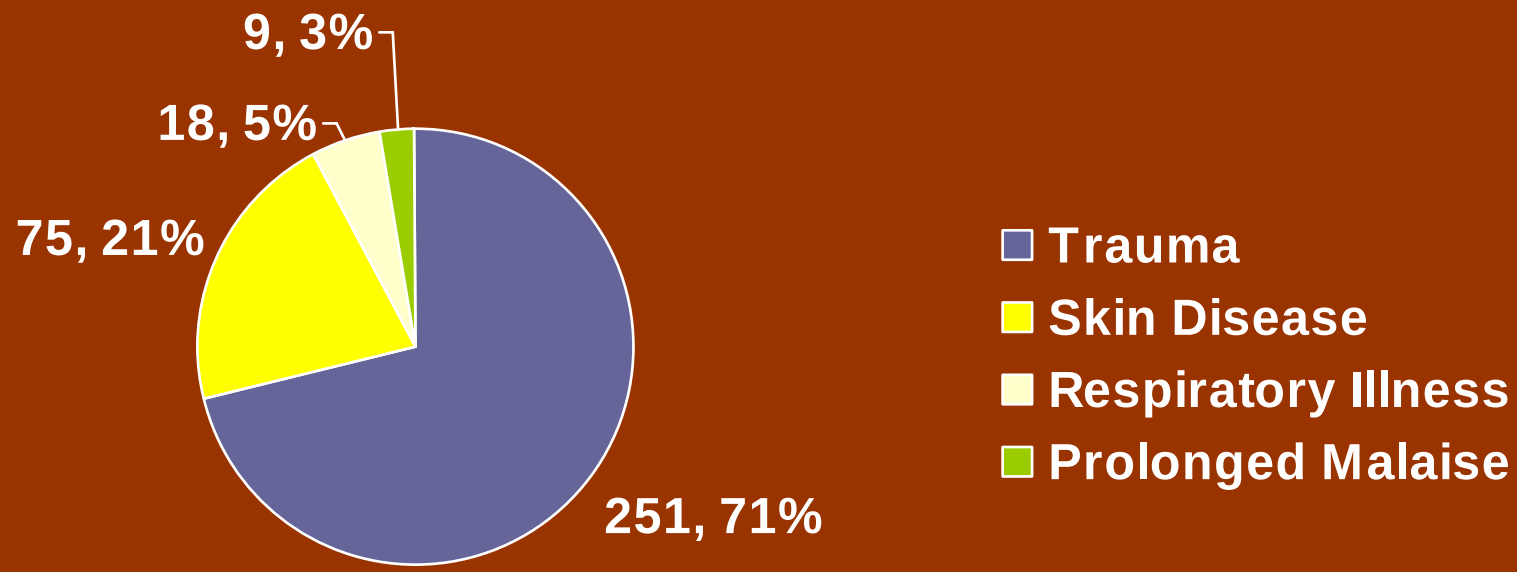
NOAA

Public Health Concerns

- Opportunities for disease transmission are increasing
- Reports of transmission of disease from marine mammals to humans are scarce!

Occupational Health Risks

Types of marine mammal zoonoses reported in marine mammal handlers



Key Point:

Trauma (bites and scratches) are the most common reported illness from marine mammals

From: Assessment of the risk of zoonotic disease transmission to marine mammal workers and the public: Survey of occupational risks, UC Davis (K005486-01)

Risk Factors

- AGENT:
  - Presence
  - Host-specificity
  - Virulence
- HOST
  - Portals of entry
  - Immune status
- EXPOSURE

Agent

Risk of zoonotic infection from marine mammals is LOW

Marine Mammal Zoonoses

POTENTIAL PATHOGEN AGENTS

- Bacterial (Seal finger, *Brucella*)
- Viral (Influenza, seal pox)
- Fungal (Coccidiomycosis)
- Protozoal (Toxoplamosis)

Exposure: Bites

Exposure: Oral, Dermal, Inhalation

Bacteria of Concern

Specific Organisms

- *Brucella*
- *Mycobacterium*
- *Leptospira*
- *Mycoplasma*
- *Erysipelothrix*
- *Salmonella*

Non-Specific Infections

- Respiratory
- GI tract
- Cystitis
- Meningitis, encephalitis
- Polyarthritis
- Osteomyelitis

Viruses of Concern

- Poxviruses
- Influenza A and B
- Caliciviruses
- Rabies
- West Nile Virus

Fungus of Concern

- *Coccidioides immitis*
- *Blastomyces dermatitidis*
- *Lacazia loboi*
- Opportunistic fungi

Biological Health Hazards: Conclusion

- Take precautions to minimize exposure
  - Safety guidelines, protective equipment

- Inform/educate physician of potential zoonotic exposure

- Marine Mammal Health and Safety Website: www.vetmed.ucdavis.edu/whc/mmz

The Effects of Oil on Marine Mammals

Oiled Wildlife Care Network

UCDAVIS WILDLIFE health center

Marine Mammal Oil Spill Response

Toxic Effects of Oil

- Oil = Complex mixture of toxic components
- Routes of Exposure
  - External
    - Physical impairment
    - Dermal/ocular irritation and ulceration
  - Internal
    - Inhalation of volatiles
    - Ingestion of oil
      - Organ damage
      - Reproductive disorders

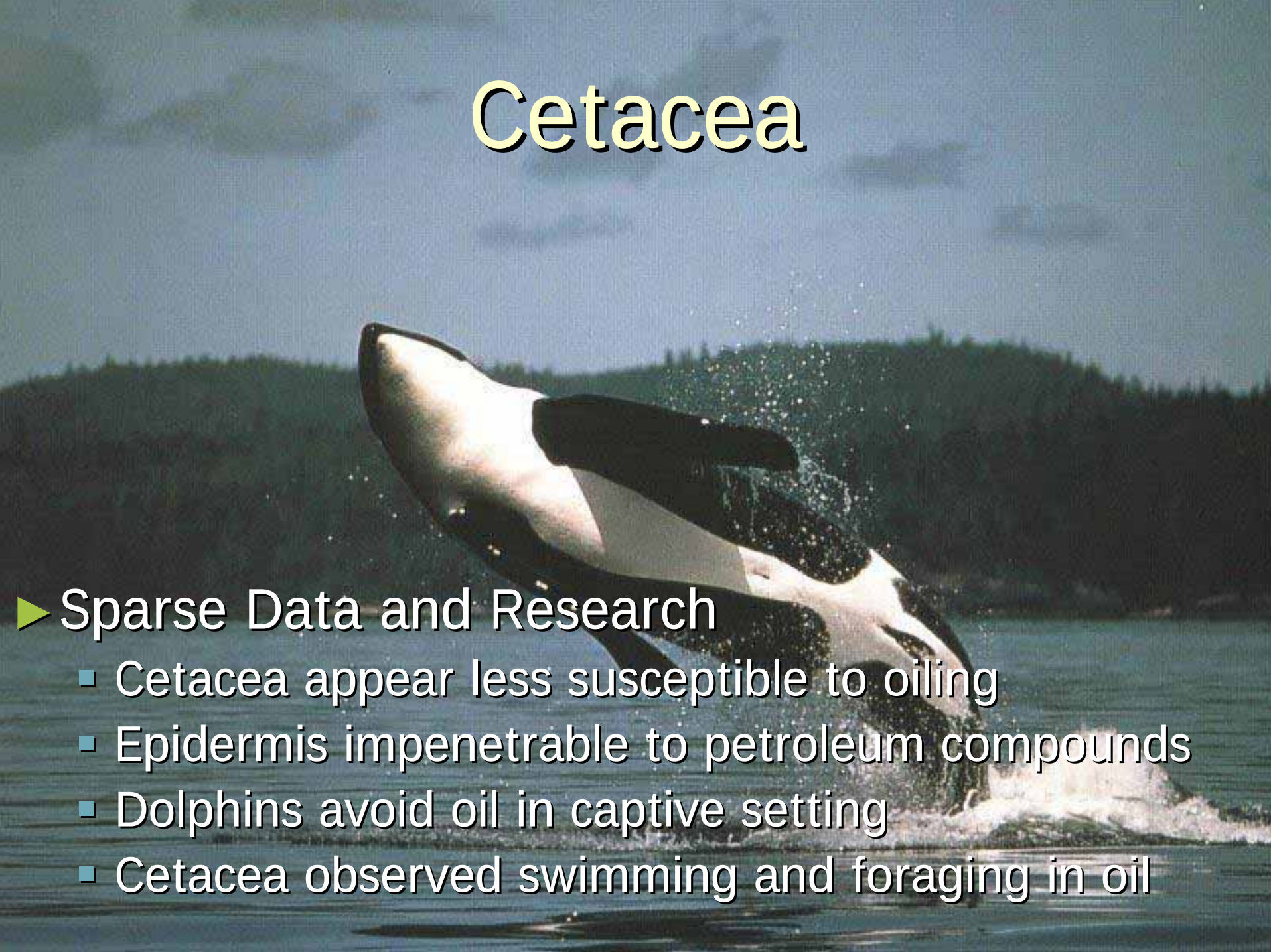
Sea Otters/Fur Seals

- Specialized fur: Keeps cold water away from skin
- Oil interferes with ability to trap & hold air
- Leads to loss of:
  - Insulation
  - Buoyancy
  - Swimming
- Causes:
  - Hypothermia
  - Dehydration
  - Starvation

Seals, Sea Lions, Walrus

- Blubber Insulation: Less reliant on fur
- Effects
  - Locomotion inhibition
  - Dermal and internal effects

Cetacea



- Sparse Data and Research
  - Cetacea appear less susceptible to oiling
  - Epidermis impenetrable to petroleum compounds
  - Dolphins avoid oil in captive setting
  - Cetacea observed swimming and foraging in oil

Effects of Oil on Harbor Seals

Evidence from *EVOS* (Loughlin 1994)

- Behavioral changes
  - No oil avoidance, “tameness”, lethargy, dullness, - visual acuity
- Physical exam findings
  - Corneal ulcers, conjunctivitis, diarrhea, + AST, ALT, LDH, anemia
- Histopathological findings
  - Conjunctivitis, epidermal/hepatic/renal lesions, neuronal damage
- Reproductive
  - 26% decrease in pup production
- Chemical analyses
  - Elevated petroleum hydrocarbons in tissues
  - Metabolites in bile present one year after the EVOS

Effects of Oil on Cetaceans

Evidence from *EVOS*

- Killer Whale Losses
  - 14 members of AB pod missing (presumed dead)
  - 11 members of AT pod missing (presumed dead)
  - Only 5 carcasses found (1990-1992)
    - Cause of death could not be determined
- Other Cetaceans
  - Record number of carcasses found (n=37)
    - Potentially due to increased survey effort
  - Tissues from 7 carcasses were tested for hydrocarbons
    - One gray whale had hydrocarbons in blubber
  - Cause of death could not be determined